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ADHESIVE-RETAINED SILICONE PROSTHESIS FOR PROSTHETIC REHABILITATION OF AN ORO-CUTANEOUS MID-FACIAL DEFECT PATIENT: A CASE REPORT

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Abstract

The defect in the mid-facial region results in significant facial disfigurement, presenting a considerable challenge to healthcare providers aiming to restore the patient's normal facial form and appearance. A well-designed prosthesis not only improve the patient's aesthetic appearance but also enhance their self-esteem and quality of life. This case report discusses the rehabilitation of a 38-year-old male patient with a mid-facial defect using an adhesive-retained silicone prosthesis. The prosthesis was fabricated using Room Temperature Vulcanizing (RTV) silicone material, carefully matched to the patient's skin tone and incorporating intrinsic colours. The prosthesis was secured to the patient's face using a Silicone-based tissue adhesive, resulting in an outcome that was well-received by the patient.

Keywords: Mid-facial Defect, Adhesive, Silicone

Introduction

Mid-facial defects refer to defects in the mid-line of the face, including the nose and upper lip, as well as defects on the sides of the face affecting the orbital contents and cheek, either individually or in combination.[1] Acquired Mid-facial defects can cause significant disfigurement and functional damage. It is essential to seek proper medical attention and treatment to avoid further complications.[2] Such mid-facial defects that involve intra-oral communication require surgical reconstruction or a facial prosthesis for management.[3] Modern dentistry has introduced several innovative surgical reconstruction techniques. However, the field still entails a significant challenge. It is crucial to restore lost structures' intricate three-dimensional anatomy and morphology while ensuring they are properly covered, lined, and supported. This often requires the use of a multi-stage technique and the availability of healthy local tissue. Facial prostheses can be

a better option than surgical reconstruction for those seeking to restore both the form and function of their face after cancer removal. With their ability to provide a natural look and feel, facial prostheses can be a more comfortable and less invasive solution. Hence, facial prostheses can be considered to improve your quality of life and regain confidence.[4,1]

Fabricating an extra-oral prosthesis can be a challenging task that requires a great deal of creativity from the Prosthodontist. The choice of material for the prosthesis depends on several factors, such as the need to engage undercuts, the mobility of the tissue bed, the size of the defect, and the weight of the prosthesis. Due to the size and weight of the prosthesis, achieving adequate retention is often a matter of concern and can be difficult to achieve. Thus the use of medical grade adhesives, resilient attachments, clips, and Osseo-integrated implants have been adopted to properly retain prostheses. These prostheses can also be connected to an obturator using magnets, spectacles, or headbands.[5]

In this case report, we describe the rehabilitation of a 38-year-old male patient with a percutaneous mid-facial defect using a Silicone prosthesis that is retained with adhesive.

Case report

A 38-year-old, male patient reported to the department of Prosthetic Dentistry, with a large defect on the right lateral lower side of the face. His chief complaint was the inability to chew or drink due to the leakage of food through the defect. A detailed case history revealed that the patient was diagnosed with squamous cell carcinoma of the right buccal mucosa of the lower lip 20 years ago. The patient had undergone surgical removal of the right buccal mucosa, and lower lip, also undergone Segmental mandibulectomy along with left neck dissection level I - III and reconstruction with fibula flap along with tracheostomy under general anaesthesia was followed by a course of chemo radiation. The healing of the surgical site was uneventful and stable for the following 3 months. After three months during follow-up, the patient presented with a recurrence of the tumor and underwent composite resection with a Pectoralis major myocutaneous flap (PMMC) in which a 2X2 cm skin defect was covered with FTSGs Full-thickness skin graft (FTSGs). After one month patient developed flap necrosis & and underwent a forehead flap. After that patient complained of trismus & and cosmetic deformity so he was referred to the Amrita Institute of Medical Sciences. There was a loss of facial contour on the left side. The skin on the margins of the defect appeared irregular. The patient was concerned about the defect and loss of facial contour. He lacked self-esteem and avoided social interactions due to facial disfigurement. As surgical reconstruction of the defect was not possible due to a history of graft rejection, Prosthetic rehabilitation with adhesive retained silicone prosthesis was planned. This prosthesis was thought to prevent the leakage of food, restore the loss of facial contour, and improve the aesthetics and self-esteem of the patient.

Procedure

The patient was seated upright in a dental chair and a facial moulage was made with high viscosity rubber impression (Aquasil) soft putty / regular set due to severe undercut (Figure 2). After proper beading and boxing, the impression was poured with type IV die stone and wax up is done. The defect was outlined on the cast and a wax pattern was made using modelling wax DPI products (Figure 3). The trial of the wax pattern was done on the patient's face to check the proper seating of the pattern and proper adaptation of the margins (Figure 4) and with the help of the wax pattern, the final impression was made with irreversible hydro-colloid to get the proper peripheral area (Figure 5). The wax pattern

was invested in type III dental stone and mould preparation was done followed by dewaxing (Figure 6). Processing of the pattern was done by packing the mould cavity with Room Temperature Vulcanizing (RTV) silicone (A-2000, Factor II, USA) after proper shade matching with the pa-

Figure 1. Extra-oral preoperative Frontal & Lateral view

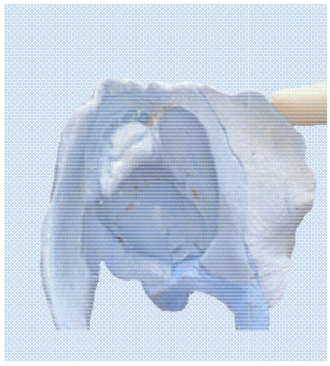

Figure 2. Impression of the defect

Figure 3. Wax pattern foF-impression.

Figure 4. Try-in of Wax pattern

Figure 5. Final impression

Figure 6. Investing the wax pattern

Figure 7 Packing of silicone into the mould

Figure 8 Postoperative extra oral frontal & lateral view

tient's skin and using intrinsic colours (Figure 7). Following the proper curing cycle, the final prosthesis was retrieved from the mould, and finishing and polishing were done. The prosthesis was tried on the patient's face for proper fit, marginal adaptation, and colour matching. After a satisfactory trial, the prosthesis was finally retained on the patient's face using water-based tissue adhesive (Probond Adhesive G609, Techno vent, United Kingdom) (Figure 8). The patient was instructed to apply the adhesive on the margins of the prosthesis and allow it to dry for 3-5 minutes before applying it to the skin. The prosthesis could be removed using soap and water. The patient was very satisfied with the final esthetic outcome.

Discussion

Large Orofacial defects can result in functional and aesthetic challenges with significant effects on patients' quality of life. This case report describes a patient with a mid-facial defect caused by a tumour, which significantly affects their quality of life after surgical removal Prosthetic restoration of large facial defects is a challenging process, given the lack of anatomic undercuts, restricted means of retention, soft tissue mobility, size, and weight of the prosthesis.[6] To overcome these challenges, practitioners have adopted auxiliary retention methods.[7,8] Although Osseo-integrated implants may provide maximum retention of the prosthesis, their large size, poor mucosal quality, and negligible bony support require supplementary surgical interventions and substantial expenses, which can impact the patient's long-term prognosis.[9]

Facial prostheses are typically made from materials such as acrylic resins, co-polymers, vinyl polymers, polyurethane elastomers, and silicone elastomers. However, none of these materials meets all the essential requirements for an acceptable prosthesis. Thus the development of silicone-based prostheses has revolutionized, providing an ideal material that fulfills all requirements. With its unique properties and versatility, silicone prosthetics offer a superior solution for those in need of these life-changing devices.[10]

The retention of prostheses used in prosthetic rehabilitation for large mid-facial defects is determined by their size and weight, which can make the procedure tedious.[11] These kind of defects lead to substantial psychological issues. In some cases, achieving acceptable aesthetics can jeopardize the retention capacity of the prostheses. Therefore, attention should be given to factors such as impression methods, materials used in laboratory trials, prosthesis design, and connection method, direction of insertion and/or removal, aesthetic factors, and maintenance protocol. By constructing intra-oral or extra-oral prostheses that jointly hold each other, proper knowledge of the remaining anatomic structures can be utilized. There are several techniques for retention for facial prostheses, including eyeglasses, eye patches, extensions from the denture engaging desirable tissue undercuts, medical-grade adhesives, magnets, and Osseo-integrated implants.[12,13]

In this case-report, patient had a medical history of undergoing radiation exposure and surgical intervention for Squamous cell carcinoma of the right lower lip. Unfortunately, the cancer had recurred and there was also the presence of graft rejection and fistula of the right mandible. Facial prostheses are considered the ideal treatment option for individuals with multiple surgical interventions and large defects in their right lower face, as compared to surgical construction. The prosthesis in this case was fabricated using Room Temperature Vulcanizing (RTV) silicone material (A-2000, Factor II, USA). This material was chosen because it is easy to customize and fabricate and has a lightweight, tissue-compatible, and stable design. Additionally, it has both extrinsic and intrinsic colouring. Various other

methods of supporting cheek prostheses are available, including magnets, headgear, and spectacles,[14] which can enhance the seal and aesthetics of the patient. In this particular case, an extra oral prosthesis was provided due to the irregular size of the defect, loss of facial contour, lack of self-esteem, and negligible socio-psychological acceptance. The patient expressed good acceptability and satisfaction with the prosthesis. To ensure successful acceptance and adaptation of prosthetics, good retention, bio-compatibility, and restoration of form and function are crucial.[15]

Implant placement was not a viable option in this case due to the multiple surgical, fistula, and graft rejection. However, a silicone prosthesis was successfully used instead. The prosthesis was highly retentive, easy to fabricate, and had impeccable colour matching. Furthermore, the patient showed great acceptance of the prosthesis.

Conclusion

The surgical reconstruction and rehabilitation of a significant mid-facial defect present a complex and fascinating procedure. Fabricating a facial prosthesis for patients with extensive defects, who have experienced a loss of self-esteem and confidence, is a significant challenge and responsibility for the clinician. Unilateral mid-facial defects involving the mandible and cheek, which are part of the movable structures, often lack stability unless highly retentive elements or techniques are employed. In this case report, a patient experiencing graft rejection recurrence and a facial defect was successfully rehabilitated with silicone prostheses, leading to favourable and well-received outcomes. Therefore, it can be concluded that utilizing facial prostheses made of silicone material and adhesive technique improves aesthetics, enhances confidence, and elevates the quality of life for patients with severe mid-facial defects.

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